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EDITORIAL

On these pages the editor offers his opinions, unshackled by advertising patrons and unrestrained by anything save a sense of the decent and the truthful. The editor, alone, is responsible for their type, their tone and their tenor.

KITCHENITIS

THE capacity for doing the right thing is as instinctively rare among men as it is common among crows, clams and mackerel.

Man, in spite of his brain growth, or because of it, is the most truth-resisting creature in the universe. He will accept the false as complacently as a shad accepts the Delaware.

No enduring truth ever entered the world without fierce opposition. The first man to intimate that the world was round and not four-cornered was burnt at the stake by a mob of squareheads. The truthful Sermon on the Mount was dark with the shadow of a coming cross.

But they say the world is more tolerant today. Perhaps so—if it be said that it is more tolerant than it ever was, of quacks and fads and fripperies.

Think of the matter of Food and Health.

Man uses less sense in his choice of food than any other animal. The crow, the clam and the mackerel having very mediocre brains, but a healthy instinct, know just what food suits them and just how much. Man, on the other hand, having developed much brain, has lost his instinct, and his judgment in food matters is atrocious.

Now a donkey was not designed as a carnivorous (flesh-eating) animal—his teeth and his digestion are not so arranged. Neither was man intended to be a flesh eater. The donkey appreciates the situation—man does not.

Nebuchadnezzar was a King of Babylon, and like most contemporaneous kings he was a glutton. He ate so much and washed so little, that he broke down, physically and mentally. He thought himself an ox and so he took to the pastures and forest where for seven years he lived close to nature. Hair sprouted on his body and

his nails grew like claws, but at the end of the seven years, on a green grass diet, he reduced his physique and increased his mentality and then returned to Judah a better king than before.

And so would most of the rabid over-eaters of today flourish better on a diet, short on meat and long on beans and cabbage. Indeed, the most prevalent disease in the world right now is Kitchenitis; our hospitals are overfilled according to the same ratio that stomachs are overfilled.

Someone has outlined a food program according to the point of view of the successful American. Let us call it: "From the Cradle to the Union League." Here it is, so arranged that you may plot the curve for yourselves:

"Milk.
Milk and Bread.
Milk, bread, egg and spinach.
Oatmeal, Bread and Butter, green apples and all-day suckers.
Ice Cream soda and hot dogs.
Coffee and apple pie.
Minute steak, fried potatoes, coffee and apple pie.
Tomato soup, roast beef, baked potatoes, asparagus, apple pie and coffee.
Bouillon, roast duck, filet-mignon, scalloped potatoes, creamed oyster plant, fruit salad, strawberry ice cream, demi-tasse.
Pate de foie gras, Veau a la Blanquette, potatoes Parisienne, egglant a l'Opera, salade Chiffonade, Peach Plombiere, demi-tasse, Camembert cheese.
Two soft boiled eggs, toast and tea.
Crackers and milk."

Abe Martin, syndicated philosopher, knew a lot about food and food foolishness when he wrote the following paragraph:

"Any time after forty, is th' critical age for both men an' women, jest as th' second summer is the critical age of an auto. A good, honest diagnostician that don't need th' money kin take his X-ray machine, rubber mallet, lung tester, searchlight an' other tools an' find out all about a used human jest as easily as a skilled mechanic can tell all about a used car. Th' human machine may be operated jest about the same as a hootch-importer's auto. It kin endure a lot, but how long? Some folks'll say, 'Oh, I'd rather die than cut out rice.' Oth-

ers feel the same about booze, smokin' an' stewed t'maters, but diagnosticians very often find that we may eat any or all o' these things. We'd hate to give up stewed t'maters but we'd willingly attempt it if we could thereby live thirty-five years or forty years longer, an' we might undertake it fer a year an' a half.

We think a feller owes it t' his family, if not t' his creditors, t' take a full once-over ever' year instead o' droppin' off leavin' a home half paid for an' a lot o' little children when his liver or kidneys or heart could have been patched up an' put on a payin' basis until he could at least git his home paid fer. Very often a fellow owes it t' th' community t' git looked into an' patched up. A feller'll take good care of a $2.00 to $12.00 straw hat an' carefully lay it away in th' fall, expectin' to git two more seasons out of it, an' then settle down to a long winter o' bread, macaroni, spaghetty, p'taters, batter cakes, hominy, mush, rice, pie, beans, fat meat, coffee and no exercise. That's jest like a foundry makin' a utility truck out of a Ford coupe.

A little sallow desk-worker'll stand on a curb fer a half an hour, waitin' till he kin safely cross the street, then he'll dive into a cafeteria an' eat enough starch t' launder a circus tent."

In other words, and in anybody's words, the sooner you go on a diet, the later you'll go on a hearse.

IVOR GRIFFITH.

Making Apples Redder

Apples coming to market in future may have their cheeks reddened by a new chemical spray, discovered by Drs. R. B. Dustman and I. J. Duncan of the West Virginia Agricultural Experiment Station. It will be a natural glow, too—not a make-up job.

Natural red color of apples is due to a pigment known as idaein, earlier researches had shown. The two chemists at the experiment station undertook to find something that would stimulate the formation of this pigment, and discovered it in several compounds involving the thiocyanate ion. These not only intensified the color of naturally red apples, but could induce a slight blush on yellow apples, like Grimes Golden, that normally have little or no red coloring.

Large-scale orchard spraying tests have now been made for four consecutive years, so that Drs. Dustman and Duncan state that they feel justified in announcing their results, in a recent issue of *Science*.

ORIGINAL ARTICLES

ANTISEPTICITY TESTS FOR OINTMENTS

By Louis Gershenfeld and Jorge E. Zepeda

Department of Bacteriology, Philadelphia College of Pharmacy and Science

SINCE ointments containing antiseptics are used with the purpose of killing or retarding the growth of microorganisms causing external infections, the methods for testing such preparations should simulate as nearly as possible their method of application. The two Laboratory methods which have been employed commonly for testing the efficiency of ointments are the Agar Plate Method and the Agar Cup-plate Method of the Food and Drug Administration (F. D. A.) Technique (1), although the Agar Cup-plate Method was not originally advocated for this purpose.

If an ointment prevents the growth of microorganisms rendering them innocuous, this preperation is considered effective as an antiseptic agent, providing the ointment remains in contact with the infected area for a prolonged period of time. The laboratory methods employed measure the inhibitory rather than the bactericidal properties of such preparations, the efficiency of the ointment being determined by its action upon cultures of Staphylococcus aureus, which meet the requirements of the F. D. A. Test (1).

Several workers have conducted researches in the past few years, mainly with the purpose of developing a new method for testing the antisepticity of ointments or improving those which are now in use.

Using the F. D. A. Agar Plate Method, Bryan (2) suggests the use of ammoniated mercury ointment as a mercury coefficient, comparing the bacteriostatic activity of this ointment with that of the ointment to be tested.

Pront and Strickland (3) suggest the molding of the ointment in a cork borer and then transferring it to the cup (Agar Cup-plate Method) with the aid of a plunger made from a cork to fit the borer.

Britt (4) recommends the use of a phenol control as a comparison test.

Purpose of This Research

This research was undertaken with the objective of:

(a) Comparing the effectiveness of the techniques used at the present time.

(b) Improving these techniques.

(c) Developing an entirely new technique which would be more satisfactory.

Procedure

(A) The following ointments were prepared and used throughout this research:

(1) Ammoniated mercury ointment (5).

(2) Phenol ointment (2%).

(3) Yellow mercuric oxide ointment (5).

(4) Bichloride of mercury ointment (6).

(B) The culture of Staphylococcus aureus used in this work was secured from the United States Department of Agriculture, Washington, D. C. This culture was tested against phenol, by the phenol coefficient technique F. D. A. (1), and was found to meet the requirements of this technique. Twenty-four hour-old F. D. A. broth (1) cultures of Staphylococcus aureus were employed, being transplanted daily with a standard platinum loop for a period of one month. At the end of each month, a fresh transfer was made into broth from stock cultures (1), and the broth culture was transplanted for a period of six days before it was used.

(C) The following techniques were employed for testing the above mentioned ointments:

(1) Agar Plate Method (1).

(2) Agar Cup-plate Method (1).

(3 Modification of the Agar Cup-plate Method:

Thirty cc. of agar (1), were melted and cooled to 40-50° C. To this was added 0.1 cc. of a twenty-four-hour-old culture of a standard Staphylococcus aureus which was grown in F. D. A. broth. Ten cc. of this agar mixture were poured into a sterile Petri-dish and allowed to

harden, the remaining agar mixture (20 cc.) was kept in a water bath at 40°-45° C. When the agar in the Petri-dish was hard, a sterile glass ring (microsublimation ring) having a diameter of 15 mm. and a height of about the same as of the Petri-dish was placed on top of it. The 20 cc. of agar which were kept in the water bath were poured around this glass ring and allowed to harden (note: better results were obtained by placing in the ice-box). When the agar was hard, the glass ring was removed with a sterile forceps. By this method a cup was obtained which was already sealed at the bottom. The cup was filled with the ointment to be tested by means of a previously flamed and cooled spatula, and then incubated for 24 hours at 37° C. under unglazed porcelain tops.

(4) Collapsible Tube-plate Method:

The ointment to be tested was placed in a collapsible tube. Thirty cc. of agar were melted and cooled to 40°-45° C., then poured into a sterile Petri-dish, and allowed to harden. A portion of the ointment was squeezed from the collapsible tube and by means of a slightly warmed spatula was cut and placed on top of the agar. The plates were incubated for 24 hours at 37° C. under unglazed porcelain tops.

Experimental Results

1. Ammoniated Mercury Ointment and Phenol Ointment tested according to the Agar Plate Method and the agar cup-plate method of the F. D. A., gave the following results:

AMMONIATED MERCURY OINTMENT

Method Employed	Width of Inhibition Zone in mm.
Agar Plate Method	6.0 to 6.5
Agar Cup-plate Method	5.5 to 6.0

PHENOL OINTMENT

Method Employed	Width of Inhibition Zone in mm.
Agar Plate Method	none
Agar Cup-plate Method	none

2. Different amounts of ointments (ammoniated mercury and phenol ointments) were weighed under aseptic conditions, and tested by the same methods, obtaining the following results:

AMMONIATED MERCURY OINTMENT

Method Employed	Amount of Ointment in grams	Width of Inhibition Zone in mm.
Agar Plate Method	0.25	5.0 to 6.0
Agar Plate Method	0.50	5.0 to 5.6
Agar Plate Method	1.00	5.6 to 6.0
Agar Plate Method	1.50	5.2 to 6.0
Agar Cup-plate Method	0.25	5.5
Agar Cup-plate Method	0.50	5.7
Agar Cup-plate Method	1.00	5.6
Agar Cup-plate Method	1.50	5.6

PHENOL OINTMENT

Method Employed	Amount of Ointment in grams	Width of Inhibition Zone in mm.
Agar Plate Method	0.25	none
Agar Plate Method	0.50	none
Agar Plate Method	1.00	none
Agar Plate Method	1.50	none
Agar Cup-plate Method	0.25	none
Agar Cup-plate Method	0.50	none
Agar Cup-plate Method	1.00	none
Agar Cup-plate Method	1.50	none

3. Three different ointments were tested by the modification of the agar cup-plate method:

Ointment Employed	Width of Inhibition Zone in mm.
Ammoniated Mercury	6.0
Phenol	none
Yellow Mercuric Oxide	6.0

4. Two ointments were tested by the Collapsible Tube-plate Method, as follows:

(a) Ammoniated Mercury Ointment was placed in a collapsible tube waxed inside and having a ribbon-like opening (length: 6 mm., width: 2 mm.).

(b) Bichloride of Mercury Ointment was placed in a tube waxed inside and having a round opening (diameter: 6 mm.).

Ribbons of different lengths were tested by this method. The following were the findings:

AMMONIATED MERCURY OINTMENT

Length of Ribbon in mm.	Width of Inhibition Zone in mm.
6.0	6.0
10.0	6.0
15.0	6.0

BICHLORIDE OF MERCURY OINTMENT

Length of Ribbon in mm.	Width of Inhibition Zone in mm.
6.0	9.0 to 10.0
10.0	9.0 to 10.0
15.0	9.5 to 10.0

5. The weight of a portion of ribbon having a length of 6.0 mm. was determined and this amount was tested by the F. D. A. Agar Plate Method:

Ointment Employed	Weight of Ointment in grams	Width of Inhibition Zone in mm.
Ammoniated Mercury	0.077	5.5 to 6.0
Bichloride of Mercury	0.077	9.0 to 9.5

6. The same amount of ointment was tested by the same method, spreading it on surfaces having different diameters:

Ointment Employed	Diameter of Surface of Spreading in mm.	Width of Inhibition Zone in mm.
Ammoniated Mercury	5.0	6.0
Ammoniated Mercury	10.0	6.0
Ammoniated Mercury	15.0	6.0
Ammoniated Mercury	20.0	6.0

Ointment Employed	Diameter of Surface of Spreading in mm.	Width of Inhibition Zone in mm.
Bichloride of Mercury	5.0	9.0
Bichloride of Mercury	10.0	9.0
Bichloride of Mercury	15.0	9.0
Bichloride of Mercury	20.0	9.0

7. Different amounts of ointments were spread on surfaces having the same diameters:

AMMONIATED MERCURY OINTMENT

Amount of Ointment Employed in grams	Diameter of Surface of Spreading in mm.	Width of Inhibition Zone in mm.
0.077	10.0	6.0
0.250	10.0	6.0
0.500	10.0	6.0
1.000	10.0	6.0

BICHLORIDE OF MERCURY OINTMENT

Amount of Ointment Employed in grams	Diameter of Surface of Spreading in mm.	Width of Inhibition Zone in mm.
0.077	10.0	9.0
0.250	10.0	9.0
0.500	10.0	9.5
1.000	10.0	9.5

8. Different amounts of ointments were spread on areas having different diameters:

AMMONIATED MERCURY OINTMENT

Amount of Ointment Employed in grams	Diameter of Surface of Spreading in mm.	Width of Inhibition Zone in mm.
0.077	5.0	6.0
0.250	10.0	6.0
0.500	15.0	6.0
1.000	20.0	6.0

BICHLORIDE OF MERCURY OINTMENT

Amount of Ointment Employed in grams	Diameter of Surface of Spreading in mm.	Width of Inhibition Zone in mm.
0.077	5.0	9.0
0.250	10.0	9.0
0.500	15.0	9.0
1.000	20.0	9.0

9. Unknown amounts of ointment were spread on surfaces having unknown diameters:

Ointment Employed	Width of Inhibition Zone in mm.
Ammoniated Mercury	5.5 to 6.0
Bichloride of Mercury	9.0 to 10.0

10. A comparison of the different methods employed in this research was conducted, obtaining the following results:

AMMONIATED MERCURY OINTMENT

Method Employed	Width of Inhibition Zone in mm.
F. D. A. Agar Plate	6.0
F. D. A. Agar Cup-plate	5.5 to 6.0
Agar Cup-plate (modification)	6.0
Collapsible Tube-plate	6.0

BICHLORIDE OF MERCURY OINTMENT

Method Employed	Width of Inhibition Zone in mm.
F. D. A. Agar Plate	9.5 to 10.0
F. D. A. Agar Cup-plate	9.0 to 10.0
Agar Cup-plate (modification)	9.0 to 9.5
Collapsible Tube-plate	9.0 to 10.0

Summary

1. A comparison of various techniques for testing ointments was made.

2. A modification of the F. D. A. Agar Cup-plate Method for testing antisepticity of ointments is described.

3. A new technique is also described. A collapsible tube is used so as to control more readily the amount of ointment employed by measuring the length of the ribbon.

Conclusions

On the basis of the experimental results obtained in this research, it can be stated that:

1. In a comparison of the Agar Plate Method and the Agar Cup-plate Method of the F. D. A., it was found that the findings are approximately the same. The Agar Plate Method however simulates better the mode of application of ointments.

2. The use of 30 cc. of agar and a microsublimation ring in the Agar Cup-plate Method is recommended if this technique is to be employed.

3. The use of an ointment ribbon is recommended, as the amount of ointment can be controlled by measuring the length of this ribbon.

4. The amount of ointment employed and the diameter of the surface on which the ointment is spread appears to make but little difference in terms of the width of the zone of inhibition which is produced.

THE INCREASING OPPORTUNITIES FOR GRADUATES IN PHARMACY, PHARMACEUTICAL CHEMISTRY AND THE ALLIED SCIENCES OF BACTERIOLOGY AND BIOLOGY

By Paul S. Pittenger, Ph. C., Ph. M., D. Sc.

Founder's Day Address, Philadelphia College of Pharmacy and Science, February 23, 1940

THE average age of the students who will graduate from this institution (Philadelphia College of Pharmacy & Science) in June, shows that most of you were born during the closing years of, or since the World War.

Most of you students were still in the intermediate grades receiving your preliminary education when we were plunged into the post war depression by the crash of 1929.

By the time you were in high school you had some reasons to be optimistic about the future. You were told on the highest authority that "Prosperity was Just Around the Corner."

You were led to believe that all the ills of industry, including those of the employee and employer alike, were to be cured by the N.R.A. You were further encouraged, by word paintings, of future benefits to be derived from the multitude of new laws being enacted pertaining to social economy.

Just as you were about to enter college the N. R. A. Blue Eagle died. Since you have been here attending college, business recovery was halted, by a war between the two major labor organizations, and then took a nose dive into the second depression, renamed a business recession.

All during your college years you have been incessantly bombarded with news of unemployment. You have now attained an age when you fully realize your ever increasing responsibilities to your family, associates and Country. You know you cannot satisfactorily meet these responsibilities without permanent employment in positions offering possibilities for future development and expansion or as owners of a successful business of your own.

You have read the statistics showing that in spite of all of our governmental expenditures, pump priming, etc., there are still ap-

proximately ten millions unemployed in this country. Two hundred thousand of whom are in our State of Pennsylvania.

This is not entirely due to lack of business or production volume. Statistics show that in the city of Pittsburgh the manufacturing plants, for the past several months, have been producing 7 per cent. more than the average produced in 1929. Still the number of unemployed greatly exceeds the 1929 figure, due to the fact that five men now produce the same amount of steel as produced by six men five years ago.

On top of this, approximately our 1000 colleges are turning out 250,000 graduates yearly.

Is it any wonder that today, more than ever before, the college graduate is pessimistic regarding the future and asks "What are my chances of success against such great odds?"

If you are pondering over this problem, stop to ask yourself the question,—"What are my chances of success in this as compared with other countries?"

We all know that a democracy is the finest but the most difficult of all governments. In spite of this knowledge, the experiments in our national government and the changes in the attitude of most of the people to their civic duties have made many of us stop to ponder, what the future may hold for us.

Samuel B. Pettengill says,— "Many who want to believe in democracy have lost heart. The long depression, the suffering of the people, the indifference of the masses, the refusal to vote, the unwillingness of the ablest citizens to hold public office or to sit on juries, the corruption of political machines, the purchase of votes from the public treasury, the appeal to prejudice and ignorance, the demagogue with his power multiplied a millionfold by the radio and the silver screen, the helplessness of the very poor who have no real choice except to hope that the siren in politics really knows, the universal preoccupation in the tasks of daily living, the movement of the people away from the sun and the soil to the city, the increase in tenancy, the dilution of the bloodstream of those who have the 'feel' of Plymouth Rock, the loss of the American frontier, the psychological shock of the World War, technological unemployment displacing vast numbers of willing workers, the average age line moving up as child and adult mortality is conquered, the industrial deadline constantly moving down to lower age levels, shutting off the most priceless of all gifts—opportunity; the lengthening years since Washington

and Franklin, and Jefferson and Lincoln; the loss of 'constitutional morality'; the weakening of the authority of parents, pastors, priests, the sense of distance between governor and governed, the hopeless feeling that one does not count. . . .!"

"Such is the catalogue of difficulties confronting democracy. No wonder it has raised up powerful critics. No wonder it has put our capacity for self-government under greater strain than we have ever known."

All of these unsettled conditions have no doubt had a depressing effect upon your outlook for the future. In many cases they may have seriously affected your piece of mind, and indirectly your studies. As graduation approaches you are primarily concerned as to your prospects of success under present conditions.

In spite of all the gloom and pessimism that will surround college graduates this year, you can all thank your Creator that you are graduating from P. C. P. & S. and in the good old U. S. A.

What are your opportunities in this as compared with other countries?

Statistics show that today America has 45 per cent. of the world's wealth with only 7 per cent. of its population. We have 70 per cent. (26,000,000) of the world's total number of automobiles; enough so every man, woman and child in the United States could all ride at the same instant of time. We have $24,000,000,000 in 44,000,000 savings bank accounts and an additional $8,000,000,000 distributed among 10,000,000 members of Building and Loan Associations. Our annual bill for recreation amounts to $10,000,000,000. Sixty-four million persons have their lives insured for a total of approximately $108,000,000,000. This is more protection than carried by all of the rest of the world put together.

In a little more than a century and one half, which represents the age of the United States, we have produced in this country three times as much wealth as existed in the entire world at the time of the signing of the Declaration of Independence.

America's growth has largely been due to our system of competitive business. Competing for the consumer's dollar by offering the most and the best for the least. As a result of this the purchasing power of the average American steel worker's wages is double that of a similar worker in France; three times that of the steel worker in Sweden; four times that of a similar worker in Germany and ten times that of the Italian worker.

There are thousands of examples of how competition increases our purchasing power. For example, the automobile industry, during a period of eight years, progressively increased the quality of their products and at the same time reduced the price to the consumer.

We are enjoying the fruits of one and a half centuries of the most successful government this world has ever seen,—our American system of free enterprise, operating under the protection of constitutional government.

In a democracy such as ours, there is always a place for the man who does a good job and plenty of room and opportunity at the top for the man who does an exceptional job.

In spite of present day business conditions and the scarcity of jobs, the old saying still holds true,— "If you preach a better sermon or build a better mousetrap, the world will make a beaten path to your door."

That's why your Alma Mater strives to give you a better pharmaceutical and scientific training in order that you may have the foundation required to enable you to build your "better mousetrap".

Equipped with the solid rounded out foundation you have received here at P. C. P. & S., your future can be whatever you want it to be, provided, however, you stick to your ideals and are willing to work hard enough to attain them and do not become discouraged or allow setbacks to break your spirit.

In other words, if you have the intestinal fortitude to stand the gaff, plenty of ambition and a moderate amount of ingenuity and originality you will have just as many opportunities to go to the top, under present day conditions, as during boom times.

If you lack too many of these qualifications your success will be just average or you will be a failure under the most ideal conditions.

Every cloud has its silver lining and as Shakespeare said,— "Ill blows the wind that profits nobody."

Too many of us have our vision obstructed by the cloud and fail to see its silver lining. Too many of us run for cover at the first blow of a wind that indicates trouble.

The men who succeed, in this world of competition are the ones who maintain their optimism and fight their hardest during times of stress and strain when the weaklings allow their spirit to be broken and "give up the ghost." The principal point, therefore, that I wish to convey to you students and especially to the graduating class is that

there are more opportunities today for Graduates in the Health Sciences than ever before.

Robert E. Lee once wrote—"The truth is this: The march of Providence is so slow and our desires so impatient; the work of progress is so immense and our means of aiding it so feeble; the life of humanity is so long and that of the individual so brief, that we often see only the ebb of the advancing wave and are discouraged. It is history that teaches us to hope".

So don't allow the pessimistic view of the masses, the statistics of the number of jobless and the unsettled conditions in Europe cloud your view of Pharmacy's silver lining, *the opportunities that your education in this Institution has opened to you.*

What has happened during these depression years to improve the standing of, and opportunities for graduates of this Institution?

Before going into the details of what I consider increased opportunities for you younger graduates, let me briefly review a few steps in the progress of pharmacy and the allied health sciences leading to the present trend in medicine.

Now please do not be scared at that statement or settle back in your seats and prepare to sleep while I rehash thousands of years of Pharmaceutical History. I have no intention of subjecting you to such an ordeal. I simply wish to cite a few historical milestones to prove the subject of my talk.

The pharmaceutical lore of China, Japan, India and Persia reach back into forgotten ages.

Ancient Pharmacy dates back some 5600 years to the oldest prescriptions found in the writings of the priesthood of ancient Egypt. One of these prescriptions written upon stone, is on exhibition in the Department of Egyptology of the Metropolitan Museum of New York. It calls for a precious green stone to be ground up and burned with the production of smoke. The remedial effects were to be derived from inhalation of the smoke. The green stones were regarded as specifics in functional neurotic symptoms. Several different kinds were available differing in price according tc the financial standing of the patient.

So if your girl friend or wife is of the nervous jittery type, moody and sometimes hysterical, don't think you are the world's only martyr and consider jumping off the Delaware River Bridge. These records show they have been treating the fair sex for these neurotic symptoms for at least 5600 years.

The Egyptian influence lasted for thousands of years during which much therapeutic value was attributed to precious stones and to all sorts of animal drugs. The latter included such things as lizard's blood, goose grease, asses hoofs, putrid meat, animal fat and the excreta of various animals including cats, dogs, flies and antelopes.

The foundations of the science of botany were laid during the period of Medieval Pharmacy by the cultivation of medicinal herbs in the monastery gardens during the eighth and tenth centuries.

During the fifteenth century medical treatment in use throughout the civilized world was herb doctoring. During this period, when Europeans became sick, they were given infusions of various herbs and plants among which were angelica, tansy, sassafras, onions, mint, garlic, etc. Even tobacco was once a sovereign remedy against disease.

It was the demand for spice medicaments in Europe that created trade with eastern countries. Ships and caravans made their perilous ways to and from India and the Orient. As a result, the competition for this trade caused explorers to chart new and shorter pathways to these countries. That is what Columbus sought to do. He discovered America, quite incidentally, in his search for drugs in the interest of medicine.

At first the Venetians controlled the spice trade and the Venetian Republic rose to power and vast wealth.

By the fifteenth century the spice and drug trade of Venice amounted to about fifteen million dollars annually. The struggle for this trade was responsible for many chapters in naval history. The outcome of the naval battles, fought in the struggle for the spice trade, determined naval supremacy and in fact lead to the founding of the British Empire.

The medicinal infusions or stews of the various medicinal herbs of this period were followed by the more scientific and efficient tinctures, extracts, fluidextracts, etc.

The next important progress was made when pharmaceutical chemistry had advanced to the stage where it was possible to isolate the active constituents from medicinal drugs such as the alkaloids, glucosides, resins, oleoresins, etc.

The next great advance was the advent of synthetic organic chemistry. During the early years of this science the organic chemist confined his efforts in the medicinal field to duplicating therapeutic products formerly supplied by Mother Nature.

For example, he made methyl salicylate to replace oil of wintergreen, synthetic sodium salicylate, synthetic camphor, vanillin, epinephrine, etc.

As knowledge in this science increased, the organic chemists, no longer content with mimicing Mother Nature, struck out for themselves. They began to improve on Mother Nature in so far as the production of valuable medicinal agents were concerned. Our most numerous and important discoveries of valuable medicinal agents for fighting the ravages of disease are being made as a result of organic synthesis. During the past twenty-five years many valuable and powerful therapeutic agents have been produced by the organic chemist. For example, the barbiturates, arsphenamines, higher alkylresorcinols, sulfanilamide, sulfapyridine, etc.

There is no doubt but that the greatest discoveries and advances to be made in medicinal agents during the next few decades will be in the form of chemo-therapeutic agents. The development and evaluation of these products can be accomplished only by close cooperation between the pharmacist, chemist, pharmacologist, biologist, and bacteriologist.

Therefore, although the machine age may possibly be replacing large numbers of skilled and unskilled workers in the various trades, this should have little effect upon men and women trained in the Health Sciences. The present trend in chemical, pharmaceutical and medical research and development has opened hundreds of opportunities to graduates of your college. We could not even dream of such opportunities during the period that "old timers" such as myself were attending college.

The demands of competitive business and Federal laws make it impossible to develop chemo-therapeutic agents or any other type of outstanding medicinal agent without close cooperation between workers trained in all of the sciences taught in this Institution.

Such workers must determine the relative value of each new product in respect to its toxicity; stability in the presence of light and at various temperatures; germicidal activity; physical reactions; incompatibilities; whether it can be standardized by chemical or physiological methods; if a chemical, whether its solutions are stable without buffering, etc.

In addition, it must be proved that each new product is not unsafe for use in prescribed doses. Prolonged administration must not

cause pathological changes in any of the organs of the body. The efficiency of each product must also be proved by clinical trial. The answers to these questions cannot be found without the closest co-operation between the pharmacist, chemist, bacteriologist, biologist and clinician.

This clearly demonstrates the additional advantages you students have in attending an institution like P. C. P. & S. where all of the Health Sciences are taught, under the same roof, with special emphasis upon their pharmaceutical and medicinal aspects. According to my mind graduates of this institution are much better prepared to make a success in the fields mentioned than those trained in the same sciences, in institutions not intimately connected with pharmacy.

This is equally true of students preparing for employment in laboratories devoted to vitamin or biologic assays or for work in pharmacological laboratories interested in the development of new products.

New Laws and Entrance Requirements: Two other important factors that have materially increased your opportunities are the increased entrance requirements and the progressively increasing stringency of Food and Drug Laws.

By limiting applicants for admission to high school graduates and the minimum pharmacy course to four college years, has had its effect in decreasing the number of students and at the same time increasing the quality of graduates. Present day graduates, due to a broader scientific foundation, have better opportunities for obtaining positions and will make better and more successful retail pharmacists.

The stringency of the new Food and Drug Laws will present many additional opportunities. Many positions formerly satisfactorily handled by good clerks, now require the knowledge and training of pharmaceutical college graduates.

A greater number of graduates are now needed to prepare label, package, and advertising statements and to fill what were formerly non-technical supervisory positions.

Trained pharmacists, chemists or physicians are required to interpret the various Municipal, State and Federal Food, Drug and Cosmetic, Insecticide, Caustic Poison, and Alcohol Laws.

With the expansion of the Federal Control System, these laws are providing many new opportunities, as enforcement officers, for

graduates in the health sciences. Pharmacists, chemists, bacteriologists and biologists are also needed in the laboratories of the various federal bureaus.

Biology: In addition to opportunities in Enforcement Bureaus, the rapidly expanding activities of the various Federal Bureaus dealing with Agriculture, Biologic Survey, Animal and Plant Industries and Forestry Services are providing excellent opportunities for students trained in biology.

This basic training is necessary for the scientific development, study, prevention and control of animal and plant diseases.

Salesmen: In our American system of competitive business pharmaceutical salesmen are competing for the time and attention of the busy physician and pharmacist. The pharmaceutical manufacturers of the country employ thousands of salesmen. The larger businesses devoted to the manufacture of ethical pharmaceutical products, employ from several hundred to as high as 1000 salesmen per company.

Years ago, only a small percentage of these salesmen were college graduates. Today more than 90 per cent .are registered pharmacists and a large percentage of the detail men have also had training in pharmaceutical chemistry or medicine.

In today's competitive market this training is necessary in order to intelligently describe the products they have to sell. The busy physician and pharmacist hangs out the welcome sign and opens his door only to the salesman who can be of help to him. The scientifically trained salesman of today is the post graduate instructor to the physician and pharmacist.

He brings to them the latest information as to the composition, indications, clinical results to be expected, etc., in reference to the newer therapeutic agents. The salesman who cannot supply this type of information soon finds his former physician customers too busy to see him. This field offers many opportunities for graduates of this Institution.

Manufacturing Pharmacists—Research: Manufacturers must continually assure themselves that their products are equal to or superior to competitive products. A manufacturer who has obtained patent protection on an outstanding new synthetic organic chemical

must, to protect his interests and product, continue researches in the entire surrounding field. His research chemists must synthesize all possible allied compounds in order to obtain priority and protection on these allied compounds. If he fails to do this, he cannot expect to derive any marked benefits from this original invention.

To successfully carry out work of this type it is necessary to have a whole group of research chemists, pharmacologists, bacteriologists, pathologists, pharmacognocists, biologists, etc.

The research pharmacist and chemist must also devise ways and means of stabilizing medicinal products. Each new synthetic chemical presents new manufacturing problems. Sodium salts of certain compounds may be more active but at the same time more hygroscopic than the acids. If tablets are to be made of such materials, it is necessary to devise ways and means of obtaining rapid disintegration, quick absorption and at the same time protect the chemical from atmospheric moisture. These are but two examples of the many types of every day problems confronting the pharmaceutical manufacturers.

Chemistry: In this age of intense industrial competition, the demand for chemists has increased a thousand fold. Competition has made it impossible for a manufacturer to survive, if he continues to make his products by "rule of thumb" processes handed down from father to son. Ever increasing numbers of chemists are needed for the testing of raw materials, process control and standardization of finished products.

All manufacturers to be successful must engage in an ever increasing amount of chemical research if they are to continue to reduce costs and increase quality.

This is just as true in the pharmaceutical industry as in industries manufacturing such products as glass, leather, artificial silk, dyes, automobiles, organic and inorganic chemicals, etc.

Standardization of Medicinal Products: Ever since three or four hundred years before King James, in 1617, gave the apothecaries a separate charter and thus released them from the domination of the "Guild of Pepperers", the pharmacist has been primarily interested in and responsible for the standards of purity of medicinal agents.

It was the apothecary who was responsible for the purity of new spices and drugs introduced into Europe as a result of the "Holy Crusades" made to eastern countries. Whenever a new article was

introduced into trade, it was handled by the Apothecary for he alone possessed the skill to judge its freedom from adulteration; their professional standing was to the customer a guarantee of purity in the purchase.

Ever since, the pharmacist has taken the lead in the standardization of medicinal products.

Milestones in the history of standardization in this country are the publication of the first U. S. Pharmacopœia in 1820, the formation and organization of the American Phamaceutical Association in 1853 with the declaration that the object of the Association was to improve and regulate the drug market; the adoption of the Purity Rubric and assay processes by the Pharmacopœial Convention of 1890; the passage of the Food & Drug Act of June 30, 1906; and the passage of the new Food and Drug Act effective June 23, 1939.

Opportunities in Control Divisions of Manufacturing Plants: The control divisions of manufacturers of pharmaceutical, biological, vitamin and cosmetic products are, of necessity, constantly broadening the scope of their activities.

They are primarily responsible for the quality of raw materials, various stages of manufacturing processes, standardization, purity and quality of finished products and the quality of packaging supplies.

Years ago the personnel of control divisions were all located in one analytical control laboratory, and all samples for whatever purpose were sent to the laboratory for check or assay. Modern operations now require that scientifically trained men, operating under the direction of the control division, be also located throughout manufacturing and packaging departments. These men constantly make, at the machines, such checks as weight, degree of hardness, thickness and disintegration time of tablets; the accuracy of filling weights and the measure of liquid preparations. Such men are also responsible for the regulation of modern scientific equipment.

Not so many years ago it was the practice to dry most tablet granulations, pills, etc., by simply placing them on trays in warm air dryers over which there was no humidity control. Such dryers case-hardened the outside of granulations, tablets and pills with the result that it would sometimes take days before the centers could be dried. Very often this had a deleterious effect upon activity. Modern, hu-

midity controlled cabinets now dry in hours or days what formerly required days and weeks. Such cabinets, however, require scientifically trained operators. Both wet and dry bulb temperatures must be understood and properly regulated to the special requirements of each individual type of product to be dried.

This is only one example of the rapid improvements being made in manufacturing equipment. Scientific training is necessary to an adequate understanding and proper operation of this modern machinery.

Each day it becomes more necessary to make scientifically trained college graduates responsible for setting of standards for control of equipment employing vacuum, steam, refrigeration, and air conditioning. Also for determining proper specifications as to the temperatures and other conditions to which each product may be subjected without deleterious effects.

The scientifically trained men of the control division must also be responsible for the nature of the equipment with which the various products come into physical contact. This includes specifications as to the nature and composition of all tanks, pans, pipes, etc. Where a large and varied line of products are made, steam and vacuum kettles, filter presses, percolators, etc., must be of various types such as copper, copper tin lined, steel, steel glass lined, pure nickel, monel metal, allegheny metal, duriron, alkanite, pyrex, bronze, wood, silver and gold plated, stainless steel, and steel rubber lined.

Each new product developed must be tested, depending upon the use to which it is to be put, for such properties as the following: germicidal activity, solubility, penetrability, stability, under varying conditions of light and temperature, toxicity, etc.

There are, therefore, unlimited opportunities in control laboratories for scientifically trained men and women for purposes other than regular routine assay and standardization.

Product and Package Control: In the days of ancient pharmacy the various concoctions of the Alchemist were almost invariably administered immediately after they were prepared. Today the manufacturer must distribute his goods through distributors, wholesalers and retailers. In addition, they are shipped to the far corners of the world to be stored under all manner of conditions.

As a result, it is not sufficient to know that a product is stable under ideal conditions. It must be packaged so it will remain, as nearly as possible, in its original state, for several years, under varying conditions. This makes it necessary that men trained in the pharmaceutical arts be in charge of package specification departments.

They must know pharmacy and pharmaceutical chemistry in order to know package requirements for each class of preparations. For example, they must determine and know the effects of the product upon the container as well as the effect of containers upon the product. Products that absorb moisture must be better protected than those that do not. Jellies or creams with a high moisture content must be better protected than those made with 100 per cent. oil or fat bases, etc., etc. They must be able to make polariscopic tests on glass to detect improper annealing, Mullen tests on corrugated packers, solubility and alkalinity tests on ampuls, etc.

Planning: With present day stream lined large scale production even the scheduling (technically called planning) of pharmaceutical production, must be done by, or in close cooperation with, pharmaceutically trained men. The personnel of planning departments must have the pharmaceutical knowledge to know the stability of each of the products to be manufactured or packaged. Naturally stable products may be manufactured or packaged in much larger batches than less stable or seasonal items.

Modern stream lining of large scale production makes it necessary to continually increase the number of scientifically trained employees necessary to plan production, prevent mistakes and guarantee quality.

Increased Specialization in Medicine: The rapid strides in medical science is leading to more and more specialization. Whereas the physician formerly relied upon his own knowledge for both diagnosis and treatment, today he depends more and more upon laboratory technicians for diagnosis. More and more private physicians are adding technicians to their office staffs and the more progressive hospitals, that formerly employed one or two technicians, now employ entire staffs for the sole purpose of aiding in diagnosis.

This trend has increased the number of opportunities for scientifically trained men in pharmacy, pharmaceutical chemistry, bacteriology

and biology with the manufacturers supplying the ever increasing number of "Diagnostic Laboratory Reagents."

These reagents must be standardized as to titre and tested for activity with known positive serums, or control antigens. The alcoholic solutions of lipoid—Noguchi, Kolmer and Kahn antigens are used for diagnosis of Syphilis, by complement fixation and flocculation reactions.

Bacterial antigens in aqueous saline solution are used for diagnosis of, gonorrheal and tubercular infections; by complement fixation.

Bacterial Suspensions in aqueous saline solution are used: for the sero-diagnosis of infections caused by typhoid and paratyphoid organisms, dysentery and the paradysentery group of organisms, Brucella Abortus, Bovine, Caprine and Suie types causing undulant fever in man and the cause of abortion in animals.

Specific agglutinating sera are used for the diagnosis of pathogenic bacteria by the agglutination reaction as: meningococci, gonococci, hemolytic streptococci, influenza bacilli and coli, and enteritidis bacilli.

Specific Serums are used for the typing of pneumococci by the capsular swelling method and hemolysins are used in Complement Fixation Tests.

Blood Grouping Serums are used for classifying donors selected for blood transfusions.

There are rapidly increasing numbers of opportunities in this field for bacteriologists, physiological chemists and biological chemists.

This specialization in medicine has also opened many opportunities for the retail and hospital pharmacist. Both are called upon to a much greater degree to prepare special formulae, especially of such preparations as must be freshly prepared and to prepare for the physician and dentist special anaesthetics, stains, sterile solutions, antiseptics, etc.

Bacteriology: In addition to medicinal bacteriology previously mentioned, we are all familiar with the opportunities afforded the Bacteriologist in such fields as water and milk analysis, fermentation, industrial and sanitary bacteriology.

According to my mind, however, the bacteriologist's greatest opportunities for future investigations are in the field of viruses.

There are more than thirty-five viruses which attack man and more than 700 viruses which attack animals, birds, fish, insects and plants. As yet our knowledge is very meagre concerning the characteristics of these viruses; their cultivation outside the body of the living host; their viability and the immunologic response elicited upon injection of a virus in pure form.

Among the virus diseases affecting man and for the prevention of which no reliable means is known as yet, the following are of most common occurrence in all parts of the world: chicken pox, influenza, herpes zoster, measles, german measles, mumps and poliomyelitis.

The prevention of virus attack to animals, birds, fish, certain insects and plants is of great importance to man. The means for prevention and control of their spread is limited to only a few.

The Bacteriologist in the Field of Preventive Medicine: The logic of the saying "An ounce of prevention is worth a pound of cure", lies in the fact that while prophylactic immunization is easy of accomplishment and the result is certain, cure is generally beset with difficulties and uncertain of results.

Without elaborating upon the modus operandi of an immunizing antigen or defining the precise differences between immunity against an infection and allergic sensitivity, suffice it to say, that extensive clinical experience has proved that the administration of a potent antigen, be it a bacterin, a vaccine, toxin or toxoid, will effect immunity against the specific agent of disease.

Production demands during the past ten years show a tremendous increase in the demand for biologicals for the prevention of disease and a marked decrease in the demand for those for the cure of disease.

There are, therefore, increasing opportunities for bacteriologists in the manufacture of biologicals for the prevention of disease. The most outstanding of these are rabies and smallpox vaccine; typhoid, whooping cough, streptococcus, cholera, plague, staphylo and other bacterial vaccines; the various toxins and toxoids; topagens; vacagens; tuberculins; etc.

Retail Pharmacy: All through my talk I have made it obvious that the pharmacist has opportunities in all of the fields mentioned.

It is also obvious that a knowledge of chemistry, biology, botany, bacteriology, physics, and mathematics is essential for the well trained pharmacist.

If you pharmacists intend to work for someone else, this broad, training will equip you for better positions. If you are going into business for yourself it will help you to be more successful. You will be more able to intelligently discuss with your prescribing physicians the methods of preparation, standardization and modes of action of the newer remedies.

This is of prime importance today when both the public and the physician are beginning to again rate the pharmacy by the type and quality of the pharmacist in charge.

Even the highly commercialized chain stores in our larger cities are aware of the mistake they have made in overemphasizing the commercial side of their business. They are rapidly putting in better, larger and more conspicuous prescription departments and placing more emphasis upon the professional side of pharmacy.

In the brief period allotted for the presentation of my subject, I have been able to skim only the surface of the ever increasing opportunities open to graduates in pharmacy, chemistry, bacteriology, and biology.

I hope, however, I have been able to cover enough of the subject to convey to you the foundation for my honest opinion that there are more opportunities awaiting you graduates of today than ever before in the history of the world. Provided, however, you have the necessary initiative and ambition to fight for your place in the sun.

To Remove Difficult Stains

To remove iron, fruit, wine or similar difficult stains from textile materials a mixture of glycerin and phosphoric acid will often prove helpful. The addition of acetone, alcohol and oxalic acid may also be made to the glycerin-phosphoric acid mixture to eradicate more stubborn stains.

ABSTRACTS FROM AND REVIEWS OF THE LITERATURE OF THE SCIENCES SUPPORTING PUBLIC HEALTH

Sulfathiazol and Sulfamethylthiazol in the Treatment of Infections of the Urinary Tract. T. L. Pool and E. N. Cook. *Proc. Staff Meet. Mayo Clin. 15,* 113 (1940). The use of the ketogenic diet, mandelic acid, sulfanilamide and neoprontosil in urinary infections is well established. In some cases results with these drugs are not obtained. A constant search has been made to find among the countless derivatives of sulfanilamide, compounds which will be effective against infections that are not eradicated by the parent substance. Sulfapyridine has been proved efficacious in the treatment of pneumonia and gonorrhea and now sulfathiazol and sulfamethylthiazole are available for clinical trial. Experimentally these drugs have been shown to be less toxic than sulfanilamide or sulfapyridine. Although the formation of renal calculi by the acetylization of sulfapyridine has been known to occur, this complication should not be so likely when sulfathiazol or sulfamethylthiazole is being used.

In a previous report it was shown that staphylococcus aureus was killed easily in vitro by these substances in high dilution. Streptococcus faecalis *was* not as readily destroyed. Furthermore, sulfathiazol was found to destroy the pseudomonas organism whereas sulfamethylthiazol did not. Clinical results paralleled these experimental findings.

A series of fifty clinical cases of urinary infection were treated with sulfathiazol and sulfamethylthiazol. The type of infecting organism varied. Fifteen were patients having urine infected with escherichia coli. Seven were reported to contain the streptococcus faecalis and five were found to contain the staphylococcus aureus. The patients received sulfathiazol and sulfamethylthiazol in a dosage of 4 gm. per day. For about 65 per cent. of the patients a sterile urine was produced. These results correspond closely with those obtained where other forms of medication were used.

It was concluded that these new drugs were just about as efficacious in the treatment of infections of the urinary as other

derivatives of sulfanilamide except in cases of staphylococcus aureus in which all were cured.

It was admittedly possible that in cases involving streptococcus faecalis the dose administered was inadequate.

Reactions in the patient were variable, some showing little reaction and a few requiring the withdrawal of the drug. Close observation of the patient is necessary in every case. L. F. T.

Anti-Grey Hair Vitamin. A. F. Morgan and H. D. Simms. *J. Nutrition 19, 223* (1940). Loss of pigmentation in the fur of rats fed diets deficient in one or more of the B vitamins has been observed by various investigators. Similar changes were seen in rats made anemic by the use of whole milk diets. Since the whole milk diet is low in both iron and copper as well as filtrate factor it is possible that deficiency in either will produce depigmentation.

In none of the earlier observations of depigmentation has there been any correlation of the phenomenon with other changes, particularly those of senescence, which might be expected to accompany the greying of the hair. Since greying must be caused by failure of pigment formation or destruction of pigment and since both the adrenal and thyroid glands have been thought to be concerned with pigment and hair growth either directly or indirectly through the sex glands these were examined in the greyed animals.

Young black or hooded rats were fed a basal diet adequate except with respect to the B vitamins and supplemented by thiamin chloride, riboflavin and a wheat germ preparation rich in vitamin B_6. The animals grew fairly well but within six to ten weeks developed a greying of the fur. Filtrates from fuller's earth treated extracts of rice bran, yeast, liver, crude cane molasses and alfalfa in every case cured these symptoms. Injection of commercial adrenal cortex and thyroid extracts cured the greying slowly. Histological study of the adrenal glands, thyroids, skin and testes showed serious damage in the greyed rats. The possible dependence of cortical adrenal and other gland function upon one of the members of the B complex and the relation of senescent changes to this deficiency are suggested.

L. F. T.

The Role of Sugar in the Etiology of Dental Caries. P. Jay. *J. A. D. A. 27, 393* (1940) No. 3. Investigators in different parts of

the world have asserted that caries could to a certain extent be controlled by improving the nutritional adequacy of the diet.

Despite the many inconsistencies found in such studies, it is undoubtedly true that caries activity has been reduced in children by dietary management.

Two facts have been brought out as important in attempting to correlate the various results. They are: 1. In practically all cases in which caries has been controlled by improving the nutritional adequacy of the diet, the carbohydrate content has also been reduced; 2. The restriction of carbohydrate in the diet always causes a decrease in the number of lactobacilli in the mouth, and since the lactobacilli are related to the activity of dental caries, the possibility arises that caries activity has been reduced through the decline in the growth of lactobacilli, a result of the restriction of sugar.

No matter how well the diets are supplemented with rich vitamin and mineral containing foods, the lactobacillus counts are not reduced and caries is not controlled if the carbohydrate content is high. If the diet is grossly inadequate, the carbohydrate, mineral and vitamin content being restricted, the lactobacillus counts drop and caries is substantially controlled.

Thus it can be seen that dental caries is not a manifestation of malnutrition and cannot be controlled simply by adding minerals and vitamins to high carbohydrate diets, but that the carbohydrate consumption must be limited.

Suppository Bases for Use in Tropical Countries. A. F. Caldwell. *Quart. J. Pharm. & Pharmacol. 12,* 680 (1939). The difficulties usually encountered in making suppositories with a cocoa butter base are connected with two important physical principles, one being the change to the metastable form which cocoa butter and other fats undergo when heated above a certain temperature and the other being due to the lowering of the melting point of cocoa butter by substances which dissolve in it.

Suppositories were made of cocoa butter melted and heated at different levels prior to pouring in molds. The temperature range was 33-40 degrees C. with variations of 0.1 degree C. The molds were cooled in ice and when completely set the suppositories were removed and allowed to stand at room temperature (29 degrees C.). Those suppositories which had been subjected to temperatures of

37 degrees C. or more completely melted at room temperature. The transition temperature (to the metastable form) therefore lies between 36 and 37 degrees C. and as the melting point of metastable form is 23-25 degrees C. which is below the average room temperature in tropical countries, it is impossible to make suppositories under these conditions if the cocoa butter is heated above its transition temperature. The metastable form on standing slowly reverts to the stable form at the same time undergoing contraction and becoming granular, the higher the temperature to which the cocoa butter has been subjected the more granular the resulting mass. In temperate climates with an average temperature of less than 25 degrees C. the effect of heat is not so important since the suppositories will solidify even if the change to the metastable condition has taken place although they may become granular and brittle on keeping.

The addition of a soluble substance such as phenol lowers both the melting point and the transition temperature. The use of hardening agents such as beeswax is not recommended as the transition temperature becomes too close to the temperature at which the mixture softens sufficiently to mold suppositories. In temperate climates they may be satisfactory but for the extemporaneous preparation of suppositories in the tropics they are useless.

Hydrogenated palm kernel oil is described for use as a suppository base in warm climates. In cases where the base is too soft owing to a high temperature or where the melting point is lowered by soluble medicaments it may be hardened by the addition of hydrogenated soya bean oil (M. P. 56 degrees C.) or beeswax. There is little change to the metastable state when the palm kernel oil is heated to temperatures well above the softening point and the lowering of the melting point due to this change is too small to be significant.

L. F. T.

The Routine Examination of Magnesium Trisilicate. J. L. Pinder. *Analyst 65,* 90 (1940) No. 767. Magnesium silicate of the approximate composition of $Mg_2Si_3O_8nH_2O$ combines effectively the action of an antacid with that of an adsorbent for a wide range of materials, including dyes, alkaloids, colloids and toxins. It is selective in that at similar concentrations some dyes are more effectively adsorbed than others.

Due to an expected increased demand for the trisilicate, it is necessary to establish tests for composition, control and adsorptive capacity.

To determine the magnesia and silica content the following procedures were adopted. The sample (0.5 gm.) was treated with hydrochloric acid, evaporated, dried and boiled with dilute acid, and the silica filtered, ignited and weighed according to the method of Treadwell & Hall.

"The filtrate was made up to 250 ml. and the magnesium was determined in duplicate—volumetrically as the 8-hydroxyquinoline complex, and gravimetrically as pyrophosphate. For the oxine procedure, 25 ml. of the solution were treated as described by Mitchell and Ward, method (1), re-precipitation of the complex being unnecessary. To the boiling, faintly acid solution, was added 5 to 10 g. of ammonium acetate (reagent), followed by about 15 ml. of 2 per cent. oxine in 2 *N* acetic acid. The solution was then made faintly alkaline with ammonia (0.880) and the precipitate allowed to settle. The supernatant liquid was filtered off through a Jena G.3 glass filter, to which the precipitate was finally transferred and well washed with hot water. The precipitate was dissolved in 100 ml. of 2 *N* hydrochloric acid, 25 ml. of *N*/10 (*M*/60) potassium bromate and bromide solution were run in, and the excess was titrated back with *N*/10 thiosulphate solution after the addition of potassium iodide; 1 ml. of *N*/10 bromate = 0.504 mg. of MgO. Results tend to be low in comparison with those obtained by the pyrophosphate method (usually 0.3 to 0.4 per cent. on the sample or 1 to 2 per cent. on the magnesium oxide), but this is offset by the greatly reduced time required, from one-half to one hour. Two hundred ml. of the filtrate from the silica determination were used for the determination of magnesia as pyrophosphate."

To determine the content of tablets, granules, etc., the sample is finely ground, gently ignited, if necessary to remove organic matter, and treated with acid as described previously. Other inorganic constituents such as precipitated chalk may be determined in the filtrate if the Mg is determined only by the oxine method.

The moisture lost on heating 1 Gm. at 100 degrees C. for four hours was returned as free moisture and further moisture lost on ignition was considered "combined" moisture.

The basicity of the compound was determined by adding 50 ml. of *N*/10 HCl to 0.2 Gm. in a 100-ml. stoppered flask and the whole

shaken occasionally for a two-hour period. The excess acid was titrated with $N/10$ caustic soda using methyl orange as indicator. The results found were expressed as ml. of $N/10$ acid per 1 Gm. of sample.

To determine the adsorptive capacity of the trisilicate a 0.2 Gm. sample was placed in a 50-ml. rubber-stoppered boiling tube.

"For experiments at room temperature, 20 ml. of water followed by 25 ml. of a 0.2 per cent. aqueous methylene blue solution were introduced from a pipette, and the tube was closed and shaken periodically; 1 ml. or 0.5 ml. samples, depending on the observed degree of adsorption, were removed after shaking the tubes and immediately made up to volume, the unadsorbed methylene blue being measured on a Hilger Spekker Absorptiometer, using the No. 1 (red) filter. The experiments at 37 degrees C. were made with 0.2 g. of material, 10 ml. of water and 35 ml. of methylene blue solution. The experiments at room temperature thus involved the use of 50 mg. of dye in 45 ml., and the experiments at 37 degrees C., 70 mg. of dye in 45 ml."

From the above experiments it was found that the maximum adsorption capacity in fourteen days varied with the temperature and samples. At room temperature samples showing low adsorption in two days showed a higher ratio of adsorption in fourteen days to adsorption in two days than samples showing a high adsorption in two days. Thus good samples reach a maximum before inferior samples. The two-day test at room temperature is thus more desirable since it indicates a difference in samples more readily.

No direct relationship between adsorption and either dry or wet volume was evident from other experiments conducted but samples with a high ratio of dry to wet volumes seem to have poor adsorption and vice versa. The dry bulk was determined by weighing 10 Gm. on paper, breaking up the lumps by smoothing with a watch glass, transferring to a 50-ml. graduated cylinder, shaking this vigorously for about five seconds, and then tapping it on a wooden bench about twenty-five times from a height of about one-quarter inch; the volume was read after one minute. Water was introduced to bring the volume to the 50-ml. mark, with shaking, and the cylinder was allowed to stand for two hours: the wet volume was then read. In many instances no distinct line of demarcation was visible before two hours; after this period the apparent volume increased, possibly owing to hydration of the silicate.

M. O. H.

SOLID EXTRACTS

By Ivor Griffith, Ph. M., Sc. D., F. R. S. A.

Despite the form in which this information is presented it may be accepted as trustworthy and up-to-date. Original sources are not listed but they may be obtained upon request.

In the snooty society squibs of a metropolitan daily paper we may soon read something like this, "the bride was gorgeously dressed in translucent cadaverine, carbolic and carbamide, trimmed with a fluffy tulle of silica gel. Her dainty shoes of urea and formalin and her hose of cotton linters silked with bisulfide added much to the synthetic character of the whole affair. The maid of honor in vinyl acetate, the bride's mother in skim milk and the groom in tears, completed the 'ersatzic' ensemble."

If, and when, we do read such a paragraph let it be understood that Nancy Scatterbrain, the society reportress is only showing off her knowledge of the new synthetic fabrics. Thus fibres and fabrics from carbolic acid, cadaverine and ammonia by complex chemical processes, are already being used to replace silk in many articles of clothing. Nylon, for instance, is very strong, stretches an extra fifth of its length, can be made into extremely fine threads, and resembles silk in appearance. Fiber-glass made from sand is another fabric that is coming into use. At the present time it is used as insulation in some shoes, in factories where strong cloth that is weatherproof and chemicalproof is needed, and to a lesser degree in homes. Lanital, of Italian origin, is a fiber made from skim milk. Aralac is said to be an American casein fiber. Both resemble wool, but are not as strong. Their biggest advantage is that they are immune from moths.

Bigger and better cannon-fodder is the modern nutritionist's promise to Mars. One of the trends shaping the future of the still unstable American "race" is the tendency toward greater height with each succeeding generation. Examination of statistics that go back for about a hundred years reveals interesting information. A study of Harvard students whose ancestors had been in America for at least two generations indicates a gradual and regular increase of one inch per generation for four generations. Similar figures have been noted for girls, at Wellesley and other colleges. Jackson at Minnesota ob-

served, "The younger college students represent a group precocious physically as well as mentally." Jackson, incidentally applies his opinion only to students *at Minnesota, not to all of the young people registered. It appears to be established that college students are taller than their parents of the same sex, but accurate figures are difficult to obtain for less selected portions of the population. The children of Japanese origin living in Hawaii and in California, however, are known to be increasing in height at a startling rate.*

There is no end to what sulfanilamide seems able to do. Listen: The newest discoveries on sulfanilamide, potent chemical remedy for many human germ diseases, come from the plant world. This chemical which, fortunately for human lives, checks the growth of bacteria, on the contrary stimulates the growth of tobacco plant roots.

"Plants receiving from 20 to 40 parts per million of sulfanilamide produced new roots from one to three days earlier than similar plants deprived of the chemical," Dr. Ernest L. Spencer, of the Rockefeller Institute at Princeton, N. J., reported.

Uncut seedlings, however, were not stimulated, and concentrations of sulfanilamide which stimplated root formation in cut plants poisoned plants with normal root systems.

Have you had Fido nose-printed? This is the latest quirk in canine custody. We are told that as a means of identifying dogs that have been lost, strayed, or stolen, a movement is afoot to "nose-print" all dogs. It is said that a dog's nose-print is the equivalent of a human's finger-prints. The nose-print is taken by dipping the nose (the dog's nose) lightly in printers' ink, then pressing it firmly to a piece of white, glazed paper.

This engineering age, against which there must soon come a real human rebellion and before the insects get us all, is certainly complete in its coverage. Shedding blood for one's country is an age old practice but here is a new way to do it. Every German soldier has a new mark on his neck, for use in case he becomes a casualty. In addition to name and outfit identification, the metal tag shows the soldier's blood group, saving valuable time in case a hurry-up blood transfusion is needed. Blood from a donor or bottled crimson fluid from a blood bank can thus be transfused without stopping to type the wounded

man's blood. This information is from Berlin via American Medical Association. The Japanese army already does this.

Vitamins may in the future have much to do with writing the world's history. The Napoleonic quip that an army moves on its stomach is of greater significance than ever since the synthetic vitamins have come into the picture. National nervousness has caused many a bitter conflict. But now nervous breakdowns which transform strong, courageous men into weak, frightened creatures and drive over-tired women into constant, jittery activity are now found to be due to lack of the B vitamins.

Discovery of the nerve-shattering effect of a diet lacking in these vitamins indicates that faulty diet widespread in a population may affect not only its health and strength but may break down its morale. Whether the ability of nations to exist in amity depends on vitamins or not, an exhortation to the Prince of Peace is more in order than ever before.

I confess that the usual caricature of Uncle Sam always made him look to me somewhat like a quack doctor. But now I *know* that he is some kind of a doctor, for he has a stethoscope in his *outside* pocket. He tells us when we may, and when we may *not* take a dose of castor oil. Yet, that may be the very kind of a *purge* that the Nation needs, in order to get rid of a great deal of the New Deal. Upon the labels of the medicines that you can buy at the Nation's drugstores there will soon be not only the names of the drugs but useful warnings when those drugs are likely to be used harmfully, for self-medicating, family remedies. Since the first of the year this new kind of labeling has been required by federal law administered by the Food and Drug Administration, but the federals making drugs safer are not likely to get tough about the labeling provisions until after the middle of the year.

Take the old familiar remedy, castor oil, which will be found wearing the following warning:

"Not to be used when abdominal pain (stomache-ache, cramps, colic) nausea, vomiting (stomach sickness) or other symptons of appendicitis are present. Frequent or continued use of this preparation may result in dependence on laxatives. Do not use during pregnancy except on competent advice."